113. The Wilmington Fire Department, which provides fire protection services to the area, will not be burdened by the project. GMP exh. JLZ-9.

114. The State Police in Brattleboro, which provides police protection services to the area, will not be burdened by the proposed project. GMP exh. JLZ-10.

115. The proposed project will not generate a significant amount of solid waste. Any solid waste that is generated will be transported to a landfill approved to accept the particular type of waste. The proposed project will not create any burdens on Vermont Sanitation Systems, which handles Searsburg's waste disposal . Zimmerman pf. at 38; GMP exh. JLZ-15.

116. The proposed project will not create any hardship in providing services by the local rescue unit that serves the proposed project area. GMP exh. JLZ-16.

117. The proposed project will improve the economic vitality of the Town of Searsburg as a result of the taxes it pays to the town, and its relatively small requirement for governmental services. The Searsburg Selectboard has expressed its support for the proposed project. Zimmerman pf. at 38-39; GMP exh. JLZ-8.

(8) Scenic and Natural Beauty, Aesthetics, Historic Sites, and Rare and Irreplaceable Natural Areas

118. The project, as proposed, will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare or irreplaceable natural areas. This finding is supported by findings 119-134 below.

119. The proposed turbines will be located on a high ridge, just below 3000 feet in elevation, in the Southern Green Mountains in Searsburg. The immediate area consists of densely wooded hillsides of transition forest with northern hardwoods, spruce and pine. The Towns of Searsburg and the northern half of Readsboro to the south are rural communities that are sparsely settled with few roads and large expanses of unbroken forests. The proposed windpower site is private property, but it abuts a large area of the Green Mountain National Forest known as the Lamb Brook area. There are several residences located within a mile of the proposed site, and immediately adjacent to the proposed substation site is the historic Fairington Cemetery. NEPCO's existing 69 kv transmission line, which will carry the power to the regional electric grid, is located 1/2 to 3/4 miles to the north. Raphael pf. at 4-5.

120. The proposed 69 kv transmission line will not be highly visible from Sleepy Hollow Road, which is an almost entirely undeveloped road bounded on both sides by continuous woodlands. During

the winter when the leaves are off the trees, one may be able to see the clearing, but not the proposed line. The clearing will only be noticeable as a white area where the right-of-way traverses a steep side slope. The visual integrity of the Sleepy Hollow Road corridor will be maintained by the preservation of the 60-foot buffer. Consequently, planting for the purpose of screening the proposed line will not be necessary. Boyle supp. pf. at 4; tr. 10/11/95 at 107-108, 111.

121. The proposed substation will be located near the intersection of Route 8 and Sleepy Hollow Road. GMP will supplement the vegetation that exists between the cemetery and the proposed substation and between Sleepy Hollow Road and the proposed substation. Twenty-five or thirty feet of the area next to the proposed substation is likely to be in a fill slope, but approximately 70 feet will be left undisturbed. A similar undisturbed buffer of 40-50 feet will exist between the cemetery and the proposed access road. GMP proposes to plant six to seven-foot tall evergreens in these buffers to insure the visual and cultural integrity of the cemetery. The intent is to naturalize the proposed substation site as soon as practicable after construction and not call attention to the proposed substation site and proposed access road. Boyle supp. pf. at 4; GMP exh. TJB-3.

122. The clearing for the proposed access road and the collection line is unlikely to be highly visible, other than as a shadow, from various viewing locations. Tr. 10/11/95 at 122-126.

123. GMP proposes to interconnect the individual wind turbines via an underground extension from the collection circuit. This will allow all utility poles to remain adjacent to the proposed service road. This placement will ensure that the poles are screened from view when at the base of the mountain. Fonte pf. at 7.

124. A clear area of approximately 40'x 40' will be maintained around the proposed wind turbine tower bases; the balance of the cleared area needed for construction will be allowed to regenerate natural vegetation. Road access to the tower base (the proposed service road), and the associated 12.5 kv line along the proposed access road, will remain cleared to protect line integrity. This clearing will be normally 50 feet to provide for a twelve-foot road, cut and fill slopes, and the proposed 12.5 kv collection line. The proposed 12.5 kv collection line will typically be on the uphill side of the proposed access road, but will cross over to the downhill side where cross slopes above the line are steep. This will minimize the need to cut further up the slope to remove trees that might fall on the proposed collection circuit and minimize the potential off-site views of the associated wind turbine construction. Boyle supp. pf. at 5-6; tr. 10/11/95 at 115, 122-125.

125. Overall, the proposed wind turbines will have limited public visibility, but they will be very

visible from the Shea and Pike dwellings and from a few locations along Vt. Route 8, a highway with relatively low traffic volumes. The proposed turbines will not be significantly visible from Route 100 or Route 9. The proposed turbines will also be visible from a few local roads, only one of which is within a distance at which the turbine towers will be able to be distinguished separately. Most of the views from local roads are at distances in excess of four to five miles, which substantially diminishes the scale and relative importance of the towers and rotors. The proposed turbines will not be visible from densely settled areas or areas of concentrated recreation activity. GMP exhs. TJB-1 at 11 and JLZ-20 & 21; also see Raphael pf. at 9-10.

126. Given that the area in which the wind turbines are proposed is largely undeveloped with many scenic attributes, the siting of eleven large wind turbines on this heavily wooded ridgeline will be substantially out of context with, and will not "fit," the existing scenic qualities of the area. Consequently the proposed project will have an adverse effect on the aesthetics of this part of Searsburg.[1] Boyle pf. at 5; Raphael pf. at 4-11.

127. The proposed project will not violate any clear, written community standard intended to preserve the aesthetics or scenic, natural beauty of the area. The Town of Searsburg has no town plan or other such standard for this proposed project to violate. Boyle pf. at 5; GMP exh. TJB-1 at 17; Raphael pf. at 12.

128. With adequate information about the benefits of sustainable wind-generated electrical energy over other energy alternatives, the average person should not find this proposed project shocking or offensive. While some individuals who live close to the proposed project may find the proposed project offensive, they are not representative of the "average person" because of their personal interest in the area and their opposition to change. These individuals generally do not oppose the concept of wind power, only the proposed location of this project. Many, most notably the Selectboards of the involved communities and representatives of the Appalachian Trail Conference and Green Mountain Club have not come forward in opposition to the proposed project. There is also evidence that the public as a whole is accepting of windpower installations given the positive value one associates with such developments. Finally, there has not been the substantial public outcry that has been evident

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1. Findings Nos. 127-134 that follow address the elements that must be reviewed to determine if the proposal will have an "undue" adverse effect on the aesthetics or scenic or natural beauty of the area pursuant to the so-called "Quechee" analysis adopted by the Vermont Environmental Board in Quechee Lakes Corporation, #3W0411-EB and #3W0439-EB.

regarding other sites or other projects. Boyle pf. at 5; GMP exh. TJB-1 at 17-18; Raphael pf. at 12-13.

129. This proposed project could play a very useful role in a comprehensive evaluation of the aesthetics of wind power facilities. This would be consistent with the research and development goals of this proposed project. Raphael pf. at 13-14. The Windham Regional Planning Commission ("WRPC") also agrees that the proposed project will be useful in assessing public opinion. WRPC letter dated 10/18/95.

130. GMP has taken reasonable mitigation measures which a reasonable person would take to improve the harmony of the proposed project with its surroundings. Specifically GMP addressed details of specific siting for roads, structures, and power facilities, coloration of structures, clearing and screening techniques and educational opportunities in order to appropriately mitigate project impacts. Boyle pf. at 5; GMP exh. TJB-1 at 18-19.

131. A key mitigation measure was the process used in selecting a site that considered aesthetics, as well as other factors, in locating the facility in a remote location that is not highly visible from highly traveled roads or population centers. Boyle pf. at 5.

132. Other key mitigation measures will include having a landscape architect or other similar professional participate in reviewing all final designs and performing on-site monitoring of construction activities, and the development of a public information or education program regarding the proposed project and the benefits of wind generation. Tr. 10/11/95 at 128-132, 237-240.

Discussion

It is very clear that the siting of a large, utility scale, wind generation project at high elevation on an undeveloped ridgeline of the Green Mountains will have an adverse aesthetic impact on the area. The proposed project will be visible for many miles from some locations, and there is no way to significantly reduce its visual impact. Nevertheless, I believe that the adverse aesthetic impact of this proposed project will not be "undue" because the proposed project will, if certain conditions are met, satisfy the requirements of the Environmental Board's Quechee Lakes analysis.

First, there are no written community standards regarding aesthetics that would apply to this situation, as the Town does not have a town plan.

Second, if the public is sufficiently educated about the benefits of wind power as a renewable energy source, the proposed project should not offend the sensibilities of the average person such that he or she would be shocked or offended. I believe that outcome is highly dependent on the viewer's

attitude about the benefits of renewable resource generation in general, and wind power in particular. Therefore, I recommend that the Board require GMP to provide an informational kiosk or similar structure for this purpose at a turnout at some point along Route 8 where the project is highly visible. At this facility, the traveling public would be able to learn about the details of the project, including its history and research and development purposes, the amount of conventional generation and resulting pollution that its production displaces, and the basic reality that all types of generation have significant costs and benefits. Feedback from visitors to such a facility will also allow GMP to determine the overall efficacy and acceptability of windpower in Vermont, which is one of the goals of this R&D project.

Finally, GMP has taken all reasonable steps to mitigate the impacts of this proposed project, including the elaborate, multi-year siting process that it undertook to find a site with minimal impacts, the landscaping that it will employ at the proposed substation site, its efforts to leave a buffer between the proposed transmission line and Sleepy Hollow road, and its use of materials and colors for the turbines that will reduce their impact to the extent possible.

In summary, if the state is to develop wind generation as a renewable resource, these types of projects must be located at these very visible, high elevations to capture sufficient wind energy to make then viable economically. We must, then, be willing to allow some intrusion into the visual landscape to be able to reap the benefits of this type of renewable energy. This proposal very clearly brings out the reality that, in terms of our energy choices, all have some significant costs to society. I believe that, in balance, this proposed project will provide sufficient benefits to the state and it's ratepayers to warrant it's approval.

Historic Sites

133. Archaeological studies have been performed for GMP, including a Phase 1A historical and background study of the proposed project area, and a Phase IB Archeological Survey. Based on this research, the existing historic period structural remains are located well beyond the limits of the proposed project-related activities, but, as a precautionary measure, GMP will erect a protective snowfence during construction around the structural remains, and it will maintain a vegetative buffer between the proposed substation and the cemetery. Also, the cemetery and structural remains will be depicted on all proposed project plans as areas to avoid during construction. No additional features or archeological deposits were located or recovered in the remaining portions of the proposed project area. Zimmerman supp. pf. at 5-6; GMP exhs. JLZ-13 and JLZ-25.

Rare and Irreplaceable Natural Areas

134. The proposed project will not have a significant impact on a designated rare or irreplaceable natural or fragile area. Letters from the Vermont Natural Heritage Program ("VNHP"); GMP exh. JLZ-11.

(8)(A) Necessary Wildlife Habitat and Endangered Species
Birds

135. No extraordinary concentrations of breeding birds occur at the proposed site, and the breeding community is typical of much of Southern Vermont forests. None of the breeding birds found on the proposed site are endangered or threatened. It is unlikely that the proposed project will result in any undue impact on the breeding birds of the area, and there will be no impact on threatened and endangered species. Kerlinger pf. at 3; GMP exh. PK-3.

136. With respect to migrating raptors, the proposed wind turbine project will not have an undue adverse impact on these birds because: (1) few hawks migrate through or near the Searsburg site; (2) those birds that migrate through the proposed site area generally do so at heights above the proposed turbine blades; (3) birds migrating or flying near wind turbines usually avoid the towers and blades; and (4) by using tubular rather than lattice towers, raptors and other birds cannot perch on the towers and thus will not be attracted to the proposed site. By encouraging the growth of shrubby vegetation and small trees, and avoiding grassy fields, the area will not attract hawks as a hunting site. GMP will adopt both of these suggestions at the site. Kerlinger pf. at 3-4; GMP exh. PK-3; tr. 10/17/95 at 51-52.

137. A study of nocturnal songbird migration at the proposed Searsburg, Vermont site was conducted between May 4th and May 26th of 1995. Migration was observed for 60 minutes per evening on 14 nights using a modification of the ceilometer technique. A 400,000 candle power spotlight/ceilometer was directed vertically and birds were observed as they passed through the beam. Observations commenced 45-60 minutes after sunset. A total of 26 migrants were observed, an average passage rate of 1.89 birds per hour. Kerlinger supp. pf. at 2; GMP exh. PK-4.

138. The rate of passage as determined by ceilometer in this study for Southern Vermont is much lower than reported for most migration studies including studies in central New York, South Carolina, Louisiana, and coastal Massachusetts. Passage rates were about the same as a study conducted in Northwestern Maine. Because of the small number of birds observed passing through the ceilometer during the study, it is likely that migration passage rates over the hilltops of southern Vermont in spring

is small. For this reason and because birds generally migrate higher than 200-300 feet at night, it is unlikely that wind turbines placed on these hills will cause an undue adverse impact on songbirds migrating through this area during the spring. Kerlinger supp. pf. at 2; GMP exh. PK-4.

139. Given that the current proposed GMP wind project is designed in part to provide research and development information about wind power in Vermont, it is in keeping with this goal to collect additional information about the proposed project's potential impacts on birds. Tr. 10/17/95 at 27.

140. GMP's avian expert assisted the Department of Public Service in its design of three studies that will help assess possible future impacts of the proposed project on birds. The studies will examine nocturnal migration of songbirds, daytime migration of hawks, and population densities of breeding songbirds. Finally, the studies will compare pre- and post-construction data. The Department has applied to the National Renewable Energy Laboratory for a grant to perform these studies. ANR exh. 5; tr. 10/17/95 at 27-28.

141. These future studies will rely on standardized field methods for migration and breeding studies. They will be the first studies conducted at a string of existing turbines, during both pre- and post-construction phases, and consequently will add greatly to our understanding of how wind turbines influence migrants and breeding birds. Information from the proposed research will be crucial to siting and permitting of other wind power projects in the eastern United States. ANR exh. 5 at 2; tr. 10/17/95 at 28.

142. The study proposal does not address potential bird mortality from strikes on the proposed turbines. Such post-construction bird mortality studies are being conducted at other wind turbine sites. Collecting bird mortality data after the proposed GMP wind project is constructed could provide useful information. Tr. 10/17/95 at 22-23, 28-31.

143. The study proposal already includes data collection at points along transects as part of the songbird breeding population study; it would be possible for the researchers to search for bird carcasses as they walk along the transects. This added study component can be designed without much difficulty, and would not add substantially to the cost of the study. The songbird breeding population study is proposed for the springtime; if a carcass search were included at the same time, it will cover a portion of the migratory period for migrant birds and a portion of the breeding period for breeding songbirds. ANR exh. 5 at 5; tr. 10/17/95 at 29-32.

144. If construction or maintenance crews leave food scraps at the proposed wind power site, it could attract scavenging predators such as crows. Consequently, GMP should ensure that no food

order on restructuring its electric industry places a premium on the development of renewable resources and provides incentives to utilities to include a specific percentage of renewables in their resource mix.[4] We, too, recognize that renewable resources can provide risk mitigation benefits that are not easily quantifiable but are extremely valuable, nonetheless.

4. Research Benefits

Both GMP and the DPS emphasize that this project will provide significant research and development benefits. In addition to operational data on how the turbines function in Vermont's climate, GMP will have an opportunity to assess the impact on wildlife and to evaluate the aesthetic impact on people in the surrounding communities. Any delay in approving this project could jeopardize the $3.5 million in DOE and EPRI grant money. Those grants, representing approximately one-third of the project cost, are conditioned upon the project being built and in service by the end of 1996. Finding 54; tr. 3/12/96 at 43-44, 59, 63.

There is no quantitative evidence in this Docket as to the economic value of the research aspects of this project. Nonetheless, it is clear to us that some of the contested issues in this Docket regarding the actual land, noise, visual, and habitat impacts will be much better understood if this project is allowed to be built.

GMP has conducted extensive research on the wind resource available at this site. The proposed technology is at least second generation technology that has been proven in other locations in the United States. The information provided by this project may produce further refinements in wind energy technology that will improve its cost-effectiveness and general applicability. Finally, the project size is modest. GMP originally planned for twenty-four megawatts; the current six-megawatt proposal is the minimum size based on research needs and economics. The smaller size is more suited, at this time, for both GMP and its Vermont ratepayers. Findings 4, 6, 9, 12, 14; tr. 3/12/96 at 77.

We conclude that the research benefits of this project are significant and provide additional support to our decision to approve this project.

5. Future Competitiveness

At oral argument, there was a brief discussion of how this project might be viewed during the transition to a more competitive, restructured electric industry. GMP acknowledged that approval of this project could result in additional stranded costs for GMP. In the alternative, GMP noted that if

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4. CA PUC R. 94-04-031/I. 94-04-032, Order of 12/20/95 (mod. 1/10/96) at 149-152.

customers in a deregulated environment were willing to pay a premium for "green" (non-polluting) power, then there may not be any stranded costs associated with this project. Tr. 3/12/96 at 73-74.

We agree that there is a great deal of uncertainty regarding the future structure of the electric industry. The interaction of federal and state criteria to encourage competitiveness while ensuring overall fairness are unclear at this time. However, our approval of this project is based on all the considerations discussed above, and not limited to the simple estimates of economic cost-effectiveness. In any future proceedings to determine the value of this project for the purpose of defining this project's stranded costs, all of the above factors will be included in that determination.

B. Environmental Considerations

At oral argument, Green Mountain Forest Watch ("GMFW") reiterated its positions presented to the Hearing Officer that this project, while small in terms of energy production, will have a tremendous impact in terms of the environment and that the Board should not approve the project at this time because GMP has not presented sufficient information to satisfy the criteria of Section 248. Specifically, GMFW argues that the large amount of construction, including roads, substation, transmission lines, and turbines, will negatively impact the remote ridgeline on which it is proposed and the surrounding area. GMFW states that these negative impacts include adverse visual effects, increased access to this remote area, impairment of critical Black Bear and tropical songbird habitat, and the generation of significant amounts of noise. In making these arguments, GMFW presented no witnesses of its own, but only cross-examined the many expert witnesses presented by GMP on these environmental issues. Tr. 3/12/96 at 6-9.

Based on our review of the record, GMP has supplied sufficient and credible evidence to meet its burden of proof for all of the environmental concerns raised by GMFW, as well as all of the other environmental criteria. All of GMP's experts provided unrebutted evidence that the effects of the project on the natural environment would be minimal. To require the detailed level of on-site analyses as suggested by GMFW for a project of this magnitude and scale before approval would not be reasonable. Because the precise nature of the impacts of this type of project on some species has not been fully documented, we are including conditions in the certificate of public good that will serve to obtain this additional information that will be based on actual field observations of the impacts of an operational wind generation facility.

The most obvious environmental impact of this project will be the visual effect of the eleven turbines located on the presently undisturbed ridgeline. There is no doubt that these turbines will have an